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ABSTRACT

This paper argues that computers in education on the Quebec (Canada), New York, and Vermont borders reflect different styles of education and cultural ethos. This paper examines a 6-month period of this educational innovation from October 1984 to April 1985. In Quebec, the Ministry of Education is involved in the purchase of computers, teacher training, and development of curriculum for computer literacy. The approach to computer use in the classroom is gradual and coordinated on both the Ministry and local levels. In the North Country of New York, local school districts purchase computers and develop systems for their use independently of other districts and, often, without state involvement. In Vermont, decisions about how the schools introduce and use computers are made by the board of education as part of a locally coordinated effort and as a function of the local community. Discussions of the varying uses of computers in each of the three geographical areas suggest that: educational planning for computers in Quebec may reflect a reaction to religion and a need to maintain a cultural identity, a labor-intensive community orientation in New York promotes competition between and continual development of institutions, and emphasis on activities in learning rather than objectives; and in Vermont local control emphasizes democracy and group decision making. (DB)

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COMPUTERS ON THE BORDER:

CASE STUDIES FROM THREE "NATIONS" --

QUEBEC, THE FOUNDRY, AND NEW ENGLAND

a research report first presented at the

Comparative and International Education Society meeting

at Stanford University, April 18 - 20, 1985

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Introductory notes

Research and educational planning often reflect the local educational milieu. This article examines the use of computers in schools on the Quebec-New York-Vermont borders. Computer use in elementary and secondary schools in this region has "exploded" in the past year or two. This paper examines a six month period of this educational innovation, from October 1984 to April 1985, and is limited to the school districts adjacent to the 45th North parallel and Lake Champlain. Of interest will be the particular confluence of institutions in three adjoining and different governmental jurisdiction that influence the planning, distribution, and use of computers in the classroom and of teacher education for this use. This article will suggest that three styles, perhaps ethos, of educational systems may be evidenced in these case studies. It will also imply that geographic proximity and similarities in ecology may not be as important factors in the evolution of an educational system or culture as are three hundred years of history, language differences, and the direction individuals look to for their metropoles. One's own best interests may not be found in what one's neighbors are doing but what the decision-makers and trend-setters in the metropole have suggested. This presentation may also suggest to the reader that comparative analysis of one's own educational systems are of interest for they may allow for local borrowing and the regional development of networks that may transcend political and social borders through individual contact.

Computers in education is a "hot" topic this year. The state government is planning to invest in the purchase of computers for each school in New York. The Governor, Mario Cuomo, in his State of the

State address has called for programs that will insure the computer literacy of all of New York's school children by the year 2000. Local school districts have invested their declining resources in the purchase and the establishment of special computer laboratories and in in-service programs on using computers in the classroom.

Location of SUNY-Plattsburgh, is also a motivator for this study. An image of North America developed by Garreau (1981) suggests that the border region of New York, Vermont, and Quebec may be the border of three "nations". Quebec, due to its maintenance of cultural identity for over three hundred years ago, is one of these "nations". The capital of this nation, Quebec City, is also the home of <<le gouvernement national>> (national government), June 24th is <<une fete nationale>> (national holiday), and as a popular drinking song goes -- <<je suis de nationalite quebecoise francaise>> (my nationality is French Quebecois).

Garreau sees Vermont as part of the nation of New England, a nation dominated by the image of the wood stove and reliance on the forests and limited farmland for life. With Boston as its metropole and stretching from Connecticut to the Maritimes, this region's images seem to be those of isolated farming and small fishing communities. New England is also a nation of town meetings for governance, of an emphasis on self-reliance.

New York is one of the states of the Foundry, the great North American industrial heartland running from the Mason-Dixon line to north of Lake Superior, from the petro-chemical plants of New Jersey to Detroit and on to Chicago. A nation of contrasts, of heterogeneity, of the melting pot, the Foundry is also like one large company town with worker groups vying for recognition and limited resources as economies react to changing technology and societal and governmental restrictions. The region on the border with Quebec is known as the

North Country and represents 29 school districts, two air forces bases, two state universities, three private colleges, two community colleges, and small to medium size (3,000 residents) hamlets in the Adirondack Mountains.

In some ways this research was endeavored to see how well this simplistic model of three "nations" would fit to explain how schools on the periphery follow the stereotypes of the metropoles. The following observations, in three brief case studies, seem to reveal interesting differences in reaction to computer technology that do seem to parallel national characteristics. The reader should be wary that the writer came to this study with a framework to test, that the information is limited to interviews with individuals and some observations of computer use, and that the whole concept of the use of computers in education is in flux and may not represent the stable state that may arrive after the novelty wears off. An attempt will be made, though, to suggest that educational innovations, and education -- the schools and all of the auxiliary support institutions -- may reflect national identity and react to change with archetypal behaviors and directions.

Case Studies in Quebec:

<<La commission scolaire de Huntingdon>> et <<Le Ministre de l'Education du Quebec>>

Locating the locus of control of the schools on the border with Quebec was not an easy task due to over-lapping jurisdictions. In this region of Quebec, there are <<commissions scolaires regionales>> (perhaps several local school commissions in combination to only share a common secondary school) and <<commissions scolaires integrees>> (commissions presiding over both primary and secondary schools. Of the school commissions responsible for the schools in the towns adjacent to the Quebec-US border, <<la Commission Scolaires Regionales

de Honore-Mercier>> and <<la Commission Scolaires Integrees de Huntingdon>> have active programs using computers over several curricula. The other commissions, de Chateauguay Valley, District de Bedford, and des Moissons, seem to just be unpacking new computer systems at this point in time, according to conversations with school administrators in December 1984 and January 1985. The programs at de Honore-Mercier seem to be stressing teacher training and an integrated introduction to computers in the classroom.

The researcher was able to visit with an adminstrator in Huntingdon and with several officials at the Ministry of Education in Montreal. The following are summaries of some observations from these visits designed to present the reader with some notions of the general direction computers in education are going on in Quebec.

Computers in the classroom in the <<Commission scolaire de Huntingdon>>

During the heavy snow storm on December 6, 1984, I visited Mr. Philipe Belisle, Director of Educational Services at the <<Commission Scolaire Catholique de Huntingdon>> (The Catholic School Commission of Huntingdon) to discuss with him the role of computers in the classrooms in his school commission. The Huntingdon School Commission is responsible for the largest area of rural and small villages in southern Quebec; its jurisdiction includes children from the Quebec side of the border north of Cannon Corners 50 miles west to the Saint Lawrence River near Fort Covington and north to Valleyfield. In area it is more than 500 square miles, making this school commission larger than the island of Montreal as well as the North Country's school districts' nearest Canadian neighbor. I mention the specific date of my visit for schools were open on the Quebec side of the border on that day when all the schools throughout the North Country were closed -- an interesting comparative event.

Mr. Belisle explained that his school district was just beginning

to include computers in their school curriculum in an organized fashion. As Director of Educational Services for this integrated school commission, his office is responsible for a secondary school in Huntingdon, 7 French-speaking and 1 English-speaking primary schools, and one school for the profoundly handicapped. For 1984, the school commission had requested and received a matching grant from the Quebec Ministry of Education of $42,000 to purchase additional equipment and software to upgrade its programs in computer science and to integrate computers across all of its curriculum. How <<la Commisssion Scolaire de Huntingdon>> incorporated this infusion of funds into its plans for computers in the classroom on both the primary and secondary levels may suggest some ideas that we may borrow from other neighbors to the North.

Primary schools

With the funds from the ministry and local resources, the school commission had also bought 7 IBM-PC-Jr.'s to start one project in each school. Each school was to present a proposal to a committee made up of the math and science consultant for the school commission, primary primary and secondary school principals and teachers, and the director of educational services, Mr. Belisle, who would in turn decide the allocation of the computers, one to each school. Mr. Belisle found that this system of granting computers following proposals worked quite satisfactorily for it required that teachers and principals developed uses for equipment and interests in their schools prior to allocations of the computers. The school commission is planning to link two of the primary schools together with a modem to explore the uses of computer networking and is encouraging the use of an IBM-PC in their special education center in Franklin Center. The English Catholic primary school under the jurisdiction of the school commission in Huntingdon has one Apple computer that was bought by a parent committee for the school and was granted one of the IBM's for a proposed project.

Secondary schools

The secondary school had as of December 1984, 16 IBM-PC used in the instruction of two courses on 1) <<Une familiarisation aux outils informatiques>> (a familiarization of information tools) and 2) <<Une initiation aux sciences informatiques>> (an introduction to information science). These two courses (known by their acronyms FOI and ISI) are taught in the general formation program 2 periods a week. These acronyms represent either a sense of humor and/or a bit of mysticism on the part of the course designers for FOI (la foi) is <<the faith>> and ISI is an Egyptian diety of wisdom and power. The first course starts with the use of calculators and surveys the general types of hardware and software currently in use and was designed by its instructors with the aid of the science and math resource consultant for the first two grades of the secondary school. Since FOI is not a course designed by the curriculum specialists at the provincial ministry of education, the school commission had to receive special permission to include it in their course offerings. The second course, ISI, is taught in the fourth and fifth years of the secondary school (the last two) and is a ministry-designed, but not required course.

The secondary school's annex at another site had 1 IBM-PC and 5 Apples in a laboratory set up to teach parallel courses of FOI and ISI. Additionally, the business-secretarial section of the secondary school have 6 IBM's for teaching word processing and a MacIntosh with a program for teaching sewing and dress-making.

Community response

There seems, according to Mr. Belisle, to be a general feeling that the school commission and the ministry of education are late in coming to their interests in computers. To fill this need for computer edcuation both the school commission and an outreach service of the University of Quebec at Montreal have provided introductory courses for

the local area teachers. The Quebec Ministry of Education through a division known as GRICS (<<Gestion des resources informatiques pour les commissions scolàires>>) (the development of computer resources for school commissions) also provides low cost computer systems to the schools. Mr. Belisle found that there is a great deal of public interest in the use of computers in the schools, with the recognition of many parents and community members that computers will play an important role in the students' and their lives in the years to come.

Some interesting suggestions from Huntingdon

As described by Mr. Belisle, the introduction of computers in the schools in this large rural school jurisdiction has been systematically planned. Computers are placed in primary schools with teachers who proposed plans for their use that reflected the students' needs. This introduction of computers in the primary schools is designed to be gradual with a computer in each school the first year with an option to replace the system with another teacher if it is not used efficiently in the original site. Additional computers will be added in subsequent years as the need arises. The commission is also introducing modems for computer-telephone communication in two of its primary schools on a trial basis.

The computer science programs in the secondary grades are designed to place computers with the evolution of mathematics and the technology and to provide the students with a working vocabulary within the information sciences. Attempts are made by the teaching staff to use computers for a wide range of subjects and specializations in the school -- from the sciences to sewing and from word processing to language learning. Secondary students are required to complete a course designed to introduce them to the fundamentals of the computer and its impact on society, with the recognition that the computers will be a part of their lives and some familiarity will be an essential

skill for the future.

An interesting lesson that may also be drawn from the experience in Huntingdon is that small, rural school jurisdictions that are just beginning to develop the use of computers in their schools may find that they are now better prepared, with careful planning, to make decisions on the choice of hardware and software and the role of the computer in their curriculum. They may also find more support from their teachers, students, and the communities they serve for there is increasing evidence of the role of computers in daily life. The development of Huntingdon's system of granting computers to teachers who make formal requests for them and the commission's introduction of modems for communication between primary schools may also suggest directions for other school jurisdictions in this region. Another lesson from studying how are very close neighbors to the north are reacting to the computer age may be that we have a great deal in common on many of the fundamental issues of the role of computers in education and that we may have important information, experiences, and insights to share across the border.

<<Le Minstere de l'Education du Quebec>>

Following interviews with Louise Dubuc and Francis Meynard of the Educational Technology Division, Richard Lacroix, Head of the Technology Division, and Normand Gagne, of the School Personnel Training Division, at the headquarters of the Quebec Ministry of Education in Montreal, an article was submitted in French to "Bip, Bip", the Ministry's journal on pedagogic applications of computers (Stoloff, 1985b). Comparing the politics of funding, the use of vocabulary, and teacher training for computers in the classroom in Quebec and New York, the article stressed that with a Ministry of Education in Quebec there may be more overt coordination of funding and the directions of educational curriculum. Evidence of this coordination is the

ministry's organization for buying computers and software on a large scale for a number of school districts and subsidizing these purchases and the ministry's preparation of introductory computer curriculum that is mandated for all students in the secondary level. The ministry also prepared publications for sharing exemplary uses of computers in the classroom and others that list university resources that may support teachers using computers.

The vocabulary of computers generated from the Ministry may reflect interesting cultural nuances or just the bizarre sense of humor of its administrators. Besides the names of the two introductory computer courses in Huntingdon, <<FOI>> (faith) and <<ISI>> (Isis), the Ministry sponsored teacher training program is called <<le projet APOTRE>> (The Apostle Project), its research organization is <<CRAPO>> (<<Centre de recherche sur les applications pedagogiques des ordinateurs>> Research center for pedagogic applications of computers) -- a possible triple entendre for besides the scatological significance, the word <<un crapaud>> (a toad) is used by Quebecois as a sort of term of endearment, and its on-line computer network between all of the post-secondary schools in Quebec is known as <<BAL>> (<<boite aux lettres>> (mail-box but also ball, carnival). These choices of titles may reflect a relationship with the Catholic religion that dominated Quebec for most of its history and the anti-clerical sentiments that some of the younger people hold throughout North America. Or, it may just reflect the workings of an individual, or committee with a sense of humor. Other vocabulary used such as <<didacticiels>>, <<logiciels>>, et <<APO>> (<<application pedagogique de l'ordinateur>>) are perhaps clearer than their corresponding English terms, respectively, "instructional software", "software", et "pedagogic application of the computer (PAC)." The last term in English has its possibilities for a person who works with PAC's could be called a PACman, PACwoman, or

a PACperson.

Teacher training for using computers has been the responsibility of local school districts until the Ministry established a month-long training program at two sites -- Montreal and Quebec City. The school commissions are encouraged, through financial support, to send one teacher to these sites for a full-time training program that includes the history of computer technology, the use of software for the classroom, some programming, and a review of Quebec-wide resources for educational computers. Each of these teachers in turn are expected to be <<agents multiplicateurs>> (multiplying agents), resource people for their commissions on the use of computers. It is assumed that by training one teacher per commission, the Ministry will be able to influence the ultimate use of computers in education. It is expected that every one of the school commissions will have had a representative completing the Ministry's program within one academic year.

The ministry has also begun to link all of the CEGEP's (<<Colleges de l'Education Generale et Professionelle>>, post-secondary institutions prior to entrance into undergraduate programs) and the universities and colleges into a computer network for sharing resources and for electronic mail. The school commissions are already linked through their administrative offices. The ministry's long-range plans include the establishment of a computer network of all of the educational institutions in Quebec, the gradual addition of computers in the classroom, and the coordination of post-secondary education programs on computers in education. The ministry is also interested in encouraging the development of a market for educational software in French, the use of computers across curriculum as a general educational tool, not necessarily a course of study, and maintaining a strong humanistic element in the use of computers. Dr. Camille Laurin, the Minister of Education, suggested that people of the next century,

having already assimilated the possibilities and limits of this new technology will develop a new humanism based on the present and the past. This new humanism will be one of collaboration and cooperation among institutions and may involve new paths of education and national identity (Laurin, December 1983).

Some general observations about computers in education in Quebec

The introduction of computers into the classroom in Quebec seems to be generally coordinated at the local level through gradual purchases. On the ministry-level, the training of one teacher from each commission, the establishment of communication linkages -- a journal for computers in education, "Bip-Bip", the beginnings of higher education computer networks, and the compilation of computer courses at the universities -- and a general philosophy that includes a humanistic approach to using computers seem to set a foundation for coordination in Quebec. There are several interesting names associated with computers in education in Quebec but they may reflect the humor of an individual and not necessarily a Jungian reaction to technology: Francis Meynard, editor of "Bip-Bip", coined the term U.T.O.P.I.E.S., <<utilisation totalement optimisee des possibilites de l'informatiqe dans un environnement scolaire>> (total, optimal use of the possibilities of information in a learning environment), in the most recent issue of this ministry publication (Meynard, February 1985).

In general, computers in the classroom of Quebec seem to be carefully incorporated by first establishing a users' group with a few computers, through the ministry's month-long course or in-service programs, and then introducing more hardware to the classroom. This more gradual approach to the introduction of computers in the schools may reflect a recognition of the cultural impact of technology on a society, an understanding of the limits of educational software that would be meaningful for the French-speaking markets in Quebec, and a

gradual training of teachers in the new technology. The introduction of computers in Quebec may be characterized as coordinated, gradual, and system-wide. This contrasts to the introduction of computers in the other two jurisdictions, "nations".

Case Studies from New York:

Northern Adirondack Central School and the North Country Teacher Resource and Computer Training Center

Computers in the classroom in the North Country, the five counties adjacent to the Quebec or Vermont borders, seem to have arrived with more speed and less over-all coordination. As in Quebec, the 29 school districts in this region chose to purchase Apples to a greater extent (508 of the 1055 computers owned by these districts) than other possible hardware -- Franklin, TRS 80's, Commodores, IBM-PC's, TI 99's, Vectors, and CCC terminals. In a district superintendents' survey in November 1984, the North Country Teacher Resource and Computer Training Center staff also found that although over 86% of the teachers in this region were interested in using computers in their classrooms, 47% had little knowledge about computers. The survey also noted that there was a regional average of 23.9 students and 1.78 teachers per computer. Over half of the schools planned to spend over $5000 in software for the present academic year (Randy, 1985).

As noted through weekly observations in seven of these school districts, computer laboratories and the introduction of individual computers into the classroom has become a common occurence this academic year. The increased opportunities for practicing teachers to learn about the use of computers in the classroom also characterize this year for computers in education on the border. Two case studies that will focus on the issue of the content of computer training for teachers and the role of institutions in this training follow.

Northern Adirondack Central School

One of the largest school districts in the region, in geographic jurisdiction, Northern Adirondack Central School (NACS) is located at the end of the Old Military Turnpike and the road that parallels the Canadian border in the town of Ellenburg. Less than five miles from the Quebec border and 25 miles from Huntingdon, the schools' students and teachers travel up to an hour to the school from the hamlets of the northern Adirondack foothills.

According to the Teacher Resource and Computer Training survey of district superintendents in November 1984, 85% of the 89 teachers in the district were interested in using computers in their classrooms, but 80% were interested but had little knowledge. There was a 15% of the teachers who were not interested in computers. As of November 1984, NACS had 46 computer accesses (28 Apple II's, 16 Apple IIe's, 1 IBM-PC, and 1 Guidance Instructional Service network link with other school districts that students enjoy using to contact a sub-culture of students throughout the state) with ratios of one computer for every 26.6 students and 1.93 teachers (Randy, 1985).

Recognizing the need for teacher training, the administrator of the elementary school contacted SUNY-Plattsburgh's Center for Teacher Education and Educational Services where most of the teachers in the region earn the graduate degrees they need to be granted permanent certification in the state of New York. The director's center contacted the author and an after-school course in Ellenburg was planned during the month of December 1984 for the "Spring" (January to May) semester.

The author recognized the need to provide the students in this graduate course in Computers in Education (EDU 580) with computer applications that will be of immediate use in their classrooms. Stress was placed on applicability and self-paced projects. A good survey

book on the issues of computers in education, RUN: Computers in Education (Harper and Stewart, 1984), was assigned as the course's text but not consistently discussed for the teachers were very interested in working with the computers and not as interested in class discussions. The teachers were assigned, after brief demonstrations, self-designed projects using the available word processing software, WORD-HANDLER, BASIC counting programs and graphics, LOGO's turtle geometric, graphics, procedures, and recursions, and a spread-sheet program like VISICALC or one of their own choices. The teachers demonstrated and critiqued available software, including OREGON TRAIL and MECC math, and reviewed magazines to present to each other very sophisticated programs. Several of the teachers came into the course with little or no knowledge or experience in using a computer; by the mid-term break, they were vying for the computer allocated to their grade levels.

A third of the grade for the course was to be based on a collaborative project that would be of use to the school and the district. The elementary school teachers and its principal planned to develop a preliminary curriculum for computer use by grade level. A pair from the high school chose to plan curriculum for their courses, while another pair developed an experimental study of the effect of word processing on student motivation to write in English composition class and on the quality of their written products when compared with their non-word processing peers. The curriculum development projects included a survey of students, teachers, and parents in the local community on their reactions to the use of computers in the classroom; a review of objectives from several sources, including the state's Regents Action Plan, for computer literacy programs and computer use across the curriculum; a survey of available software and how they would support these objectives; and a detailed discussion of suggested

activities and software use for the objectives of each grade level.

The results of three of the surveys designed to prepare for the curriculum development phase for the school were revealing. A survey of 160 grades 1 and 2 (primary) students and 233 grades 3 through 6 (elementary) students at NACS notes that the majority of students use computers one or more times a week in either their own classrooms or the media center that has a bank of 6 computers; the elementary grade students averaged 35 minutes a week. Math was the subject most often practiced on the computer. Over 99% of the students in both groups liked using computers and over 94% were not afraid of the computers even though 51% of the primary students reported that they could not use the computer without their teacher's help. The elementary students were confident (over 94%) that they could operate a computer but had some reservations about their keyboard skills, using BASIC and LOGO, a word processor, or the printer. Only 20% of those surveyed had a computer at home (Shutts, 1985).

There were 165 responses (out of a possible 620) to a survey of parents. Of those responding, 25% have computers at home that their children use. Home use was 90% games and 10% learning to program for the students. The majority of parents (79%) knew that their child's grade level had an Apple computer available for its use and 90% thought that their child used the computer at least once a week. The parents (85%) thought that the most important use of the computer in the classroom was to have the students learn a computer language. They expressed concerns about the availability of computers to all of the students, that boys were encouraged more than girls to use the computer, and that the computers should be used to augment, not supplant, the teaching process (Trombley, 1985).

Thirty-eight teachers (out of 89) responded to a survey on their use of computers. The majority favored computer instruction in

in-service workshops and on staff development days, instead of specific graduate courses. Over 60% would like their own classroom computers, less than 15% felt that the computer freed them to do other classroom activities. The computers were used for remediation, fun activities, instruction, and reward in that order in their classrooms. Over 57% of the respondents were comfortable with using computers in their class and 50% felt that they would effectively use a computer in their classroom. In their open-ended comments, the teachers suggested that an computer instructional resource person be hired, that computers were effective for remediation, and that students were enthusiastic about using computers (Boyea, 1985).

The major lesson learned from this teacher training experience in the Northern Adirondack Central School is that learners, in this case the teachers, seem to enjoy collaborating, cooperating, and helping each other to learn about how to program and use the computer. With a task oriented and applicability stressed approach to this course, the teachers began to successfully integrate the computer as a support for classroom instruction. Some implications from this experience as an observer-participant in the schools include that university faculty might find the resources and the environment of the pre-college classroom very conducive for after-school courses, that teaching about computers should have a large element, nearing all, of hands-on activities, and that learning about computers, especially in an atmosphere of peer support, may be not as intimidating an exercise as one might imagine.

North Country Teacher Resource and Computer Training Center

A coalition of teachers and their unions; administrators, superintendents, and their organizations; the State Education Department and their outreach units, the Boards of Cooperative Educational Services (BOCES); and a few state university colleges

combined to form centers for the in-service training of teachers in areas that are shown, by survey, to be perceived needs. The North Country Teacher Resource and Computer Training Center (TR/CTC) was established in the Fall of 1984 and began to offer in-service classes in the month of February. Housed in the Center for Teacher Education and Educational Services at SUNY-Plattsburgh and officially an organ of the 2 BOCES responsible for Clinton, Franklin, Essex, and Hamilton counties in the northern tier of the state of New York, the TR/CTC's governing board is composed of teachers and administrators, with a representative from the BOCES and the State University.

The Director of the TR/CTC, a former elementary school teacher, educational consultant, and a trustee of the State University of New York, planned with the governing board for the first course offerings following her appointment in mid-January. The TR/CTC set up five afternoon centers of 25 teachers each for the study of computers in education in scattered locations in the Adirondacks. Public school teacher with expertise in computers in the classroom developed and implemented the courses. These courses were designed to provide the teacher participants with 1) "a working knowledge of the equipment and software needs and the operational components that enable a computer to process information," 2) the ability "to use the programming structured approach to solving problems with students on the computer, in the academic subjects and in everyday life," 3) the ability "to evaluate computer software for effective classroom utilization," and 4) the proficiency "with a utility program that routinely assists the classroom teacher" (North Country Teacher Resource and Computer Training Center, 1985). The programming languages to be studied include LOGO and BASIC and there is a stress on the applications of computers to the classroom.

The raison d'etre of teacher centers seems to be that practicing teachers with expertise in specific areas may serve as effective

instructors of other teachers for they understand the school milieu and the subject matter to be studied. In some ways, the rise of teacher centers in the state of New York may result from the growing gulf between Schools of Education and the practitioners in the pre-college schools. It may also represent the specific subject needs of teachers who already have master's degrees, now required for permanent certification in New York, and do not wish to pursue further graduate studies. Teacher centers, teachers teaching each other, funded by the State Department of Education, appear to be creating parallel university courses and administrations and taking over some of the service functions, including in-service training, of Schools of Education and school districts. It may also parallel a tendency in labor with unions collectively planning and managing their own work, whether it is a factory that is threatened for closure or training in educational technology. Schools of Education, as well as all of higher education, after the Yeshiva decision, may be popularly classified as part of the management and not responsive to the needs of the worker (teacher). To continue to be effective educational leaders, Schools of Education may have to return to their original school bases and faculty and university administrators may have to renew bridges to local schools.

The North Country Teacher Resource and Computer Training Center is currently developing a Kindergarten through 12 grade curriculum in computer literacy. The author serves as an educational consultant to the four teacher participants who are serving as grade level consultants to teams of teachers who are attending morning workshops to develop this curriculum. An interesting issue, whether one should have objectives for the curriculum developed before exemplary activities compiled was raised at the first of these workshops. Following arguments that seemed to parallel debates on the primacy of theory vs. practice or of red vs. expert, most of the teachers present

felt that the collection of activities that would be readily useful in the classroom was more important than the development of a series of objectives for a course in computer literacy. Techniques in using computers in the classroom seemed of more immediate use than the discussion of global issues on the affective change that computers may cause in the classroom. This split between action vs. affect seems to parallel discussions in any union of workers or professionals.

Some observations about computers in education in New York

In the North Country, there has been a tendency to purchase computer hardware before teachers were trained to incorporate the new technologies into their classrooms. In reaction to this lack of coordination of purchase and training, several institutions - the State University, school district in-service, staff development sessions, the Boards of Cooperative Educational Services, the Teacher Resource and Computer Training Center, and local businesses developed training programs for teachers. Successful training programs for teachers seem to stress hands-on experiences and applicability to the classroom. The Teacher Resource and Computer Training Center with its teacher-instructors seems to be most likely to perform this service function of in-service computer training for it represents a coalition of interest groups in education. The experience at Northern Adirondack Central School, of teachers collaborating on computer training, may serve as a model of the university's presence at the educational front-line and of the potential of teachers as researchers and participant observers.

In comparaison with Quebec, the implementation of computers in education in New York has been less well coordinated on a regional basis, the training programs until recently have not been standardized, and the approach to training has been more application than theory. The state government has only been an indirect player - through the

funding of teacher resource centers and of hardware for the schools - in educational computers. Other sources - teacher unions and school district administrators and superintendents - have played more direct roles in the course of computer training than the state. This tendency in non-ministry of education nations, of a certain lack of coordination of educational programs and of greater local control, is also reflected in a case study from Vermont.

Case Study from Vermont: District 8

Vermont's District 8 (the Franklin/Northwest Supervising Union) is located in the northwestern corner of the state along the Quebec and New York border. Headquartered in Swanton, about 25 miles from Ellenburg on the eastern shore of Lake Champlain, the district was in its second year of computer involvement during the academic year 1984-85. In an interview with Mr. William Williams, Assistant Superintendent, a stress on local control of schools, and therefore on the use of computers in the classroom, was discussed. Before a week long summer of 1984 session on computers for the teaching staff and members of the school board, most of the computers used in the schools in the supervising union were funded through Chapter 2 funds for educational remediation. The summer session in-service and other computer workshops drew between 60 to 70% of the classroom teachers and this enthusiasm influenced a board member to call for increased funding for computers in the district. Currently, there is one computer for each 30 of the 2500 students in the supervising union; 75% of these computers were purchased in 1984. These purchases were supported through the local budget, for no state funds were made available. The state education department does offer some help in curriculum development: 20% of the supervising union's budget is from state sources. The majority of the funding is decided at local school board meetings which traditionally takes place at the local town meetings

45 minutes after their openings.

Last year, computers in the classroom in District 8 were used primarily for computer-assisted instruction, remediation, and special education. This year, there is a greater variety of computer applications including the development of a advanced preparation course for the SAT's, simulations for science and social studies, and business uses. The supervising union looks forward to obtaining a federal grant for computer bilingual education.

Teacher training is also based on locally developed curriculum. The supervising union relies on the local support of the labor and administration in the high technology industry in Burlington and therefore gathers their input for discussion at the town meetings of the school budget and for the developed of this curriculum. Two post-secondary schools - Champlain College and the University of Vermont, especially Dr. Frank Watson of UVM's Education Department, also add to the planning of this training. Mr. Williams suggests that the three emphases of these training programs were (in descending order of importance) 1) teaching using computers across the curriculum, 2) supplementing instruction, and 3) classroom management tasks.

Computers in education and teacher training in its use in Vermont may be characterized as being locally controlled and coordinated. Teacher training is provided by local higher education institutions within in-service programs that include members of the entire school community. Innovations are controlled through a consensus of individuals at town meetings and little attempts are made to coordinate school programs across district lines or throughout the state. The contrasts between computers on the border in Vermont, Quebec, and New York will follow in the next section.

Some comparative conclusions

Computers in education on the Quebec, New York, and Vermont borders

seem to reflect three different styles of education and cultural ethos. In Quebec, the Ministry of Education is involved in the purchase, teacher training, and the development of curriculum for computer literacy. Through it Educational Technology division, the Ministry is setting a humanistic tone for using computers, developing a philosophical approach to pedagogic applications that include a bit of whimsy and a great deal of human relations. The Ministry's development of a one teacher per commission approach to training change agents for the educational innovation and the Minister's, Camille Lauren, appeal that the computer be used to create a new humanism suggest a coordination from the upper-levels of the educational system consistent with the "national" aspirations of Quebec. In Huntingdon, a system of providing computers only after a competitive granting process creates a user's group and local coordination of computers. The approach to computer use in the classroom is gradual and coordinated on both the Ministry and local levels.

In the North Country of New York, there isn't as much coordination between educational institutions and the state. Local school districts purchase computers and develop systems for their use independently of each other. Teacher training is provided by several educational institutions with teachers teaching each other, either in in-service programs or teacher resource centers, as the present preferred model. Teacher training has often followed the acquisition of computer hardware; curriculum and activity development often follows this training. There has yet to be developed a coordinated philosophy on computers in education for the state or for the region. A stress seems to be on applications for computer use in the classroom, on process and results, instead of objectives and goals.

In Vermont, the local town meeting seems to control the objectives, curriculum development, purchases, teacher training, and future

planning of computers in the supervising union. Some outside information from local higher education institutions support local in-service community workshops developed by local teachers. Decisions about how the schools are to introduce and use computers are made by the board of education that meets 45 minutes into the monthly town meeting. The state of Vermont supplies less than 20% of the schools' budget and has little direct influence on planning for computers. There are no regional educational computer users' groups, nor teacher resource centers. Computers in education in Vermont is a locally coordinated effort and a function of the wishes of the local community.

How well do these descriptions of computers on the border, in the classrooms of these three "nations" parallel the cultural stereotypes of these communities? The coordinated unity of educational planning for computers in Quebec may reflect a close knit society that is in reaction to religion, the need to maintain a cultural identity, and the deliberation and gradualism of a cultural group that is conservative at root. In the North Country, the competition and continual development of institutions, for teacher training or within school district for experts and computer laboratories, the stress on activities over objectives, and the purchase of equipment before the establishment of use may reflect a labor-intensive orientation characteristic of a Foundry. In Vermont, local control and coordination of computers in the classroom may also reflect that "nation's" emphasis on town meeting democracy and on group decision-making by consensus. These preliminary observations of three "nations" and their reactions to an educational innovation may be a bit exaggerated but seem to suggest that the schools may reflect the characteristics of their communities and their reaction to change.

Some other lessons learned from this brief study of six months include that teacher training for computers in the classroom should

have a good amount of "hands-on" activity. Collaborative efforts among teachers should be encouraged. Most of the ministry of education officers, the school administrators, teachers, parents, and students polled during this study seem to recognize that computers will continue to be part of education from now on, but that a human element will be even more essential in the classroom. Computers are here to stay in the classrooms on the border, in these three "nations". Minister of Education Lauren (1983) may suggest a sentiment common to all of the educational institutions described in the previous pages that "we intend by introducing the computer throughout the educational system to develop tomorrow's people with a humanity and social conscious by using the best of the immense possibilities of this tool of countless applications." A final lesson suggested by this study is that the use of computers in the classroom is only at its initial stages, the possibilities and changes to education have only just begun.

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